REMARKS

Claims 1-9 were rejected as unpatentable over Claxton in view of Apelewicz in view of Kost. Applicant requests reconsideration.

Apelewicz describes quadrature processing. Applicant concedes that processing one baseband signal or two signals in quadrature is a matter of application, and that quadrature processing in the complex format would be obvious. However, the combination of Claxton and Kost does not suggest the present invention.

Claxton is directed to front-end electronic processing of single input signal for use in a channelizer. The front-end electronic processing includes low noise amplifiers and mixers with a single ADC used to convert an amplified and downconverted analog signal into digital form. The digital output of the ADC is the only input into the channelizer 22. The channelizer may be selected from a number of well-known digital channelizers and possibly a number of channelizers may be used with a switch. Claxton does not discuss the limitations of the ADC sampling rate. Claxton does not discuss the number of quantizer bits. Claxton does not discuss how such limitations may be overcome when the bandwidth of the wideband signal at the channelizer input is so high that a single ADC may not be available to achieve the required sampling rate and number of quantizer bits. In Claxton there is a channelizer 22 having a single digital input and a plurality of channelized outputs. The Claxton reference is merely an example of a use of a prior art

channelizer that could be a polyphase channelizer with an internal commutating function.

Kost describes an analog-to-digital (ADC) conversion system for wideband signals. The system includes a plurality (two) of A/D converters (ADC), a digital-to-analog converter (DAC), and a digital signal conditioning stage. The Kost system permits a sampling rate that is a multiple of a single ADC. The Kost system however does not describe any channelization, but merely uses a plurality (two) of polyphase samplers and converters for providing polyphase digital output. The Kost system then recombines the polyphase digital outputs into a single signal 57. So, when fairly read, Kost teaches splitting, polyphase staggered sampling, and subsequent combining for increasing the sampling speed.

In the present invention, the polyphase ADC 14, including the samplers 34a-m and converters 36a-m provides a plurality of digital outputs that are time staggered. These time-staggered samples are fed directly into a polyphase filter bank 42a-m. Time staggering for purposes of channelization has been performed in the prior art channelizers by internal commutators, not shown in the cited references. The present invention does not include a commutator for channelizing a sampled digital input. The combination of Claxton and Kost does not teach or suggest that these time-staggered samples in Kost can be directly fed into the polyphase filter bank for eliminating the need for a commutator.

Particularly, Kost shows a plurality of staggered signals that are combined. Claxton shows a channelizer having a signal input. The combined signal 57 of Kost would be fed directly into the input of the channelizer 22 of Claxton. Kost teaches a single combined output and Claxton teaches the use of a single input to the channelizer. The combination of Claxton and Kost suggests, when fairly read, to polyphase stagger sample the input signal for increased speed of sampling using slow speed converters, combine the staggered samples as a single input, and feed that input into Claxton's channelizers.

Claxton and Kost do not suggest to replace the prior art single sampler with a bank of samplers for providing polyphased staggered signals that are effectively commutated. Kost teaches staggered sampling for improved speed. When applied to Claxton's conventional channelizer, the staggered digital output would not be applied to the single input to the channelizer 22. Kost certainly does not suggest using a bank of samplers and converter for eliminating the need of a commutator by feeding the staggered digital output into the polyphase filters. In the present invention, the bank of samplers and converters effectively functions as a commutator. The present invention is well deserving of patent protection. The present invention does not include a commutator, necessary in Claxton to channelize the single input into a plurality of commutated polyphase digital outputs. Rather, the present invention uses polyphase staggered sampling and converting as an extension of Kost and applied to channelization for a new purpose, and that is to perform both high-speed sampling

and polyphase commutating during channelization. As such, the bank of samplers and converters are not merely high-speed samplers and converters but become, in effect, a front-end channelizer of channelized digital outputs that can be then fed directly into the bank of u1-m polyphase filters. The polyphase staggered digital outputs from the samplers and converters are directly fed into the u1-m polyphase filter bank 16 without the use of a commutator. The combination of Kost and Claxton does not suggest the effective front-end polyphase commutation through the use of a bank of samplers and converters. In the preferred form, there is a one-to-one and onto mapping between the sampled and converted digital outputs to the u1-m filters and the channelization outputs 48a-m, but other mappings could be used. The present invention provides a full bank of samplers and converters for effective front-end polyphase channelization. In the present invention, the digital outputs to the u1-m filters are at a low rate of the samplers and converters, and as such, the channelization function of the present invention need not operate upon an ultra-high speed single input signal for further cost savings with improved system performance. The present invention not only provides high speed staggered input sampling, as in Kost, but also provides effective channelization by the samplers and converters without the need for commutation and with polyphase filter banks operating on low sampled rates digital input for improved performance.

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The combination of Kost and Claxton is a front bank of Kost's samplers and converters providing digital outputs that are combined as Kost's output 57 that is then fed into Claxton's conventional channelizers. Kost and Claxton do not teach feeding the sampled and converted outputs directly into a bank of polyphase filters. Allowance of the claims is requested.

Respectfully Submitted

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